

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : E04F 15/04, 15/14, 13/08	A1	(11) International Publication Number: WO 96/27721
		(43) International Publication Date: 12 September 1996 (12.09.96)

(21) International Application Number: PCT/SE96/00256	(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 29 February 1996 (29.02.96)	
(30) Priority Data: 9500810-8 7 March 1995 (07.03.95) SE	
(71) Applicant (for all designated States except US): PERSTORP FLOORING AB [SE/SE]; Strandidaregatan 8, S-231 25 Trelleborg (SE).	
(72) Inventor; and	
(75) Inventor/Applicant (for US only): MÅRTENSSON, Göran [SE/SE]; Vallby 878, S-231 97 Klagstorp (SE).	
(74) Agent: STENBERG, Yngve; Perstorp AB, S-284 80 Perstorp (SE).	
	Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: FLOORING PANEL OR WALL PANEL AND USE THEREOF

(57) Abstract

Flooring panel or wall panel and a use thereof in a wet room. The panel is provided with a locking means in the form of groove (6) and tongue (7) forming a tongue/groove joint for assembling of the panels. The groove (6) and the tongue (7) are made of water tight material and formed with a snap-together joint.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

FLOORING PANEL OR WALL PANEL AND USE THEREOF

The present invention relates to a flooring panel or wall panel and the use thereof in a wet room.

During the last few years laminated floors have achieved and increased popularity and on many markets they are beginning to replace parquet floors and wall-to-wall carpets. At the production of laminated floors a decorative thermosetting laminate is first produced. This laminate usually consists of a base layer of paper sheets impregnated with phenol-formaldehyde resin and a decorative surface layer consisting of a decor paper sheet impregnated with melamine-formaldehyde resin. The laminate is produced by pressing the different layers at a high pressure and an increased temperature.

The laminate obtained is then glued to a carrier of particle board for instance or used as such without any carrier and it is then called compact laminate. The laminated panel thus produced is then sawn up to a number of floor boards which are provided with groove and tongue at the long sides and the short sides. Often the floor boards produced have a thickness of about 7 mm, a length of 120 cm and a width of about 20 cm. Thereby they can usually be put on top of an existing flooring material at a renovation. According to another alternative, instead one or more of the above decorative sheets can be laminated directly towards a base sheet of particle board for instance.

At the assemblage of such a flooring glue is normally applied in the groove when the floor boards are assembled. Therefore, it will be difficult to change a damaged board or to remove a whole flooring and for instance install it in another room.

To avoid the above problem efforts have been made to achieve floor boards which can be assembled without glue. One such construction is disclosed in the U.S. patent 5,295,341. There the boards are provided with groove and tongue in the usual way, but here a snap-together system is included in the groove-tongue joint.

These floor boards can be assembled without glue. However, they have the disadvantage that the joints between the boards will be flexible and not rigid. This means that if the surface below the floor boards is not completely even which is usually the case, a gap will be formed between the boards. In these gaps dirt and water can penetrate.

According to the present invention also the last mentioned problem has been solved and a flooring panel or wall panel, preferably of thermosetting laminate having two pairs of parallel side edges has been brought about. Two of these side edges

are provided with a locking means in the form of a groove and the other two with a tongue fitting in the groove whereby a tongue/groove joint for assembling of the panels is formed. The groove and the tongue are made of a water tight material and formed with a snap-together joint including one or more snapping webs or the like with corresponding cooperating snapping grooves. The groove in front of the snap-together joint has an entrance opening and continues inside the snap-together joint in a stabilizing groove. The tongue is formed with a rear neck intended to fit in the entrance opening and a forwardly protruding stabilizing part situated in front of the snap-together joint and intended for a tight fit in the stabilizing groove, whereby connecting panels when assembled by the snap-together joints and the stabilizing parts in the stabilizing grooves are fixed to each other and prevented from unintentional separation while at the same time a rigid floor covering or wall covering respectively with water tight joints and without unintentional gaps between the panels is obtained.

According to one preferred embodiment two adjacent side edges of the panel are provided with a groove and the other two side edges with a tongue. At this embodiment the panel is usually rectangular, but it can also be square.

At square panels it is also possible to provide a pair of parallel sides with a groove and the other pair with a tongue. However, the choice of pattern on the surface layer of the panel is limited at this shape.

It is preferred that the groove and the tongue are made of thermoplast, a thermosetting laminate, aluminum or a chipboard or particle board impregnated with a thermoplast. Of course also other water tight materials can be used.

At one embodiment, the groove as well as the tongue are formed as a ledge fixed to the side edges of the panel. Suitably the ledge-formed groove and tongue respectively are then fixed in a recess along the side edges with glue for instance.

The snapping webs can be formed on the upper and/or lower side of the tongue while fitting snapping grooves are formed in the groove.

In one preferred embodiment one snapping web is formed on the upper side of the tongue and one on the lower side thereof while the groove has two fitting snapping grooves one at the top and one at the bottom.

If necessary one pair of snapping webs can be formed on the upper side of the tongue and one pair on the lower side thereof. Of course you then need two snapping grooves at the top and two snapping grooves at the bottom of the groove to fit with the snapping webs. This construction will give an extremely strong joint.

Of course the snapping webs can instead be arranged in the groove and the snapping grooves on the tongue.

In one preferred embodiment the width of the stabilizing part is 2-10 mm, preferably 4-10 mm. Generally a wider stabilizing part with fitting stabilizing groove gives a better rigidity of the assembled panels.

The stabilizing part will also assist in a correct assemblage of the panels. Thus, when the stabilizing part moves into the stabilizing groove you get a correct level of the panels and the panels can easily be pushed into the correct position where you do not have any gap between the panels. Of course without any substantial gap between the panels water and dirt are prevented from entering the assembled flooring or wall covering.

As a safe guard against water penetration a seal might be arranged in the inner part of the stabilizing groove for instance.

Preferably the grooves and the tongues run the full length of the side edges of the panels.

The panels can be designed in such a manner that the under side of the groove and the tongue are situated in the same level as the under side of the panel.

The panels can be used for covering floors and walls in ordinary dry rooms. However, due to the rigid and water tight joints the panels can be used also for wet rooms. For such applications the whole panel is preferably made of thermosetting laminate of so-called compact laminate type. Such a laminate does not absorb water.

Another alternative is a non water absorbing base with a water tight surface. The surface may for instance consist of paint, a thermoplastic foil such as polyethylene, polypropylene or polyvinyl chloride, a paper sheet impregnated with thermosetting resin or of a thermosetting laminate.

One suitable non water absorbing base is a board produced by pressing wood particles or wood chips impregnated with a thermoplastic.

The invention will be further explained in connection with the enclosed figures of which figure 1 schematically shows a panel 1 according to the invention seen from above. The panel is drawn with a rectangular shape but it can as well be square. Figures 2 and 3 show a cross section through two adjacent edges of two embodiments of a panel where two such panels are to be assembled. The construction according to figure 2 is preferred.

The panel 1 consists of a base of wood particles impregnated with a thermoplastic with a decorative thermosetting laminate as a surface layer 17 glued on top.

The panel 1 has two pairs of parallel side edges 2, 3 and 4, 5 respectively (Fig. 1). Two of these side edges are provided with locking means in the form of a groove 6 and the other two with a tongue 7 fitting in the groove 6, whereby a tongue/groove joint for assembling of the panels is formed.

The groove 6 and the tongue 7 are made of a water tight material and formed with a snap-together joint. In the embodiment shown in figure 2 the snap-together joint consists of two snapping webs 9, one on the upper side of the tongue 7 and one on the lower side of tongue, these webs 9 cooperating with two fitting snapping grooves 10.

In front of the snap-together joint, which means the snapping webs 9 and the snapping groove 10, the groove 6 has an entrance opening 8. Inside the snap-together joint the groove 6 continues in a stabilizing groove 13.

The tongue 7 is formed with a rear neck 11 intended to fit in the entrance opening 8 of the groove 6. In front of the snap-together joint the tongue 7 has a forwardly protruding stabilizing part 12 intended for a tight fit in the stabilizing groove 13.

The parts 9 and 10 included in the snap-together joint are also adapted to each other to give a tight fit and strong joint. To increase this effect further the snapping grooves 10 are provided with undercut edges 18 which cooperate with the backside of the snapping webs 9 with the same undercut.

The groove 6 and the tongue 7 are made of thermosetting laminate and formed as a ledge fixed by glue in a recess along the side edges of the panel. The under side 14 of the groove 6 is situated in the same level as the under side 15 of the panel and the under side 16 of the tongue 7 is situated in the same level as the under side 15 of the panel 1.

When connecting panels have been assembled by the snap-together joints and the stabilizing parts 12 inserted in the stabilizing grooves 13, the panels are fixed to each other and prevented from unintentional separation. A rigid floor covering or wall covering with water tight joints and without unintentional gaps between the panels is obtained. The usual rotation of the snapping webs 9 in the snapping grooves 10 is prevented by the stabilizing parts 12 in the stabilizing grooves 13. Accordingly these parts are essential for the possibility to get a rigid joint between the panels.

The embodiment shown in figure 3 is very similar to that according to figure 2. The difference is that only the under side of the tongue 7 is provided with a snapping web 9. The upper side is lacking a snapping web. Accordingly there is only one snapping groove 10 at the bottom of the groove 6.

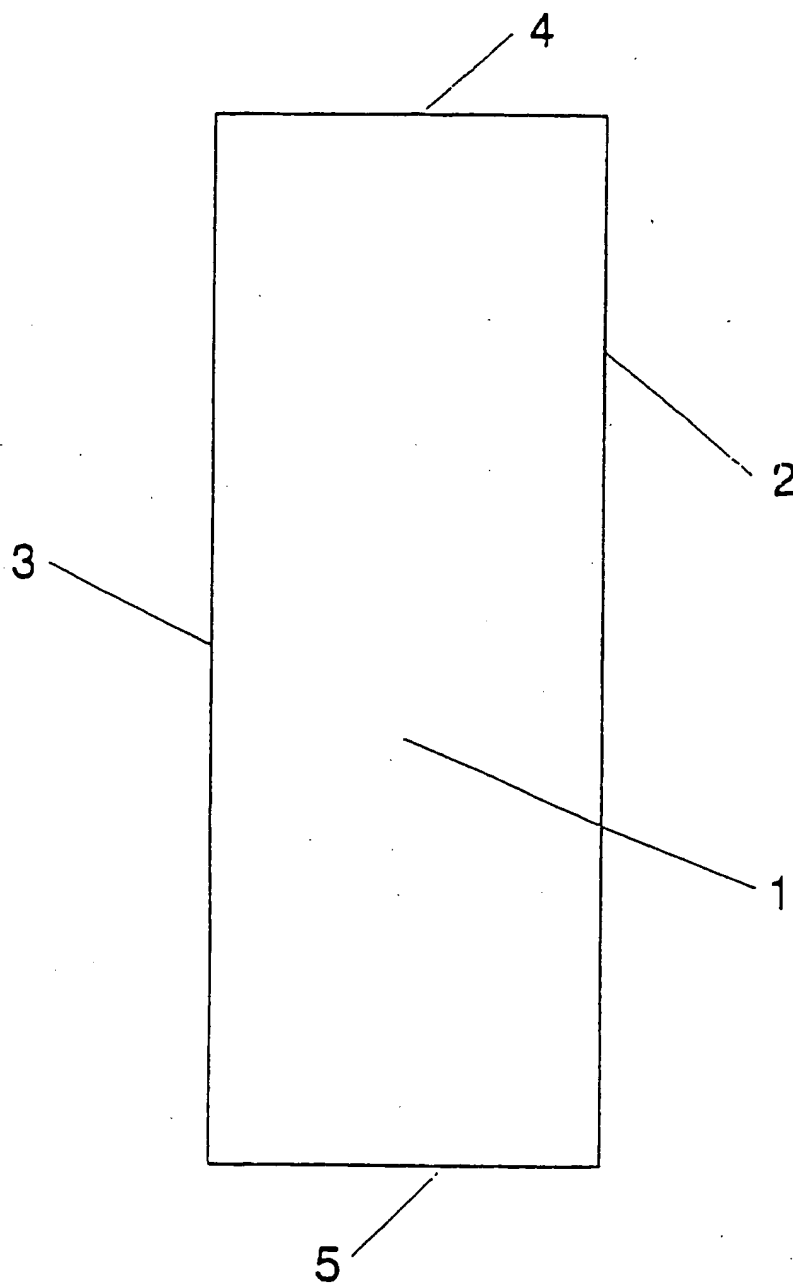
The invention is not limited to the embodiments shown since these can be modified in different ways within the scope of the invention.

Claims

1. Flooring panel or wall panel, preferably of thermosetting laminate having two pairs of parallel side edges (2, 3 and 4, 5 respectively), two of these side edges being provided with a locking means in the form of a groove (6) and the other two with a tongue (7) fitting in the groove (6) whereby a tongue/groove joint for assembling of the panels is formed, characterized in that the groove (6) and the tongue (7) are made of a water tight material and formed with a snap-together joint including one or more snapping webs or the like (9) with corresponding cooperating snapping grooves (10), that the groove (6) in front of the snap-together joint has an entrance opening (8) and inside the snap-together joint continues in a stabilizing groove (13), that the tongue (7) is formed with a rear neck (11) intended to fit in the entrance opening (8) and a forwardly protruding stabilizing part (12) situated in front of the snap-together joint and intended for a tight fit in the groove (13), whereby connecting panels (1) when assembled by the snap-together joints and the stabilizing parts (12) in the stabilizing grooves (13) are fixed to each other and prevented from unintentional separation while at the same time a rigid floor covering or wall covering respectively with water tight joints and without unintentional gaps between the panels is obtained.
2. Panel according to claim 1, characterized in that two adjacent side edges (2, 4) are provided with a groove (6) and the other two side edges (3, 5) with a tongue (7).
3. Panel according to claim 1 or 2, characterized in that the groove (6) and the tongue (7) are made of thermoplast, a thermosetting laminate, a chipboard or a particle board impregnated with a thermoplast, aluminum or the like.
4. Panel according to any one of claims 1-3, characterized in that the groove (6) as well as the tongue (7) are formed as a ledge fixed to the side edges of the panel.
5. Panel according to claim 4, characterized in that the ledge formed groove (6) and tongue (7) respectively are fixed in a recess along the side edges.

6. Panel according to any one of claims 1-5, characterized in that the snapping webs (9) are formed on the upper and/or the lower side of the tongue (7), while fitting snapping grooves (10) are formed in the groove (6).
7. Panel according to claim 6, characterized in that one snapping web (9) is formed on the upper side of the tongue (7) and one on the lower side thereof, while the groove (6) has two fitting snapping grooves (10) one at the top and one at the bottom.
8. Panel according to any one of claims 1-7, characterized in that the width of the stabilizing part (12) is 2-10 mm, preferably 4-10 mm.
9. Panel according to any one of claims 1-8, characterized in that the under side (14) of the groove (6) is situated in the same level as the under side (15) of the panel (1).
10. Panel according to any one of claims 1-9, characterized in that the under side (16) of the tongue (7) is situated in the same level as the under side (15) of the panel (1).
11. Panel according to any one of claims 1-10, characterized in that the inner part of the stabilizing groove (13) is provided with a seal for improvement of the water tightness.
12. Use of a panel according to any one of claims 1-11 for covering the floor and/or the walls of a wet room.
13. Use according to claim 12, characterized in that the panel is made of thermosetting laminate of so-called compact laminate type or of a non water absorbing base with a surface layer (17) consisting of paint, a thermoplastic foil, a paper sheet impregnated with thermosetting resin or of a thermosetting laminate.
14. Use according to claim 12, characterized in that the base under the surface layer consists of a board produced by pressing wood particles or wood chips impregnated with a thermoplastic.

Fig. 1



2/3

Fig. 2

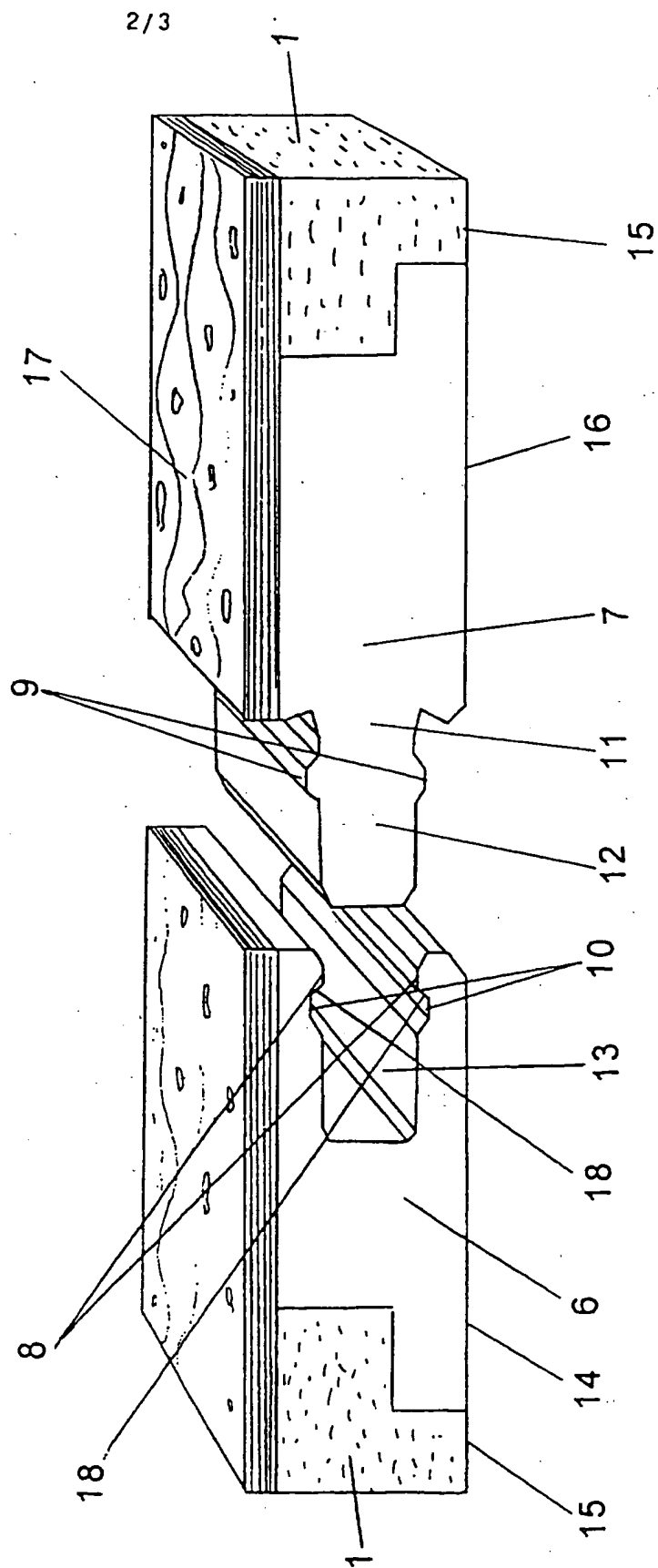
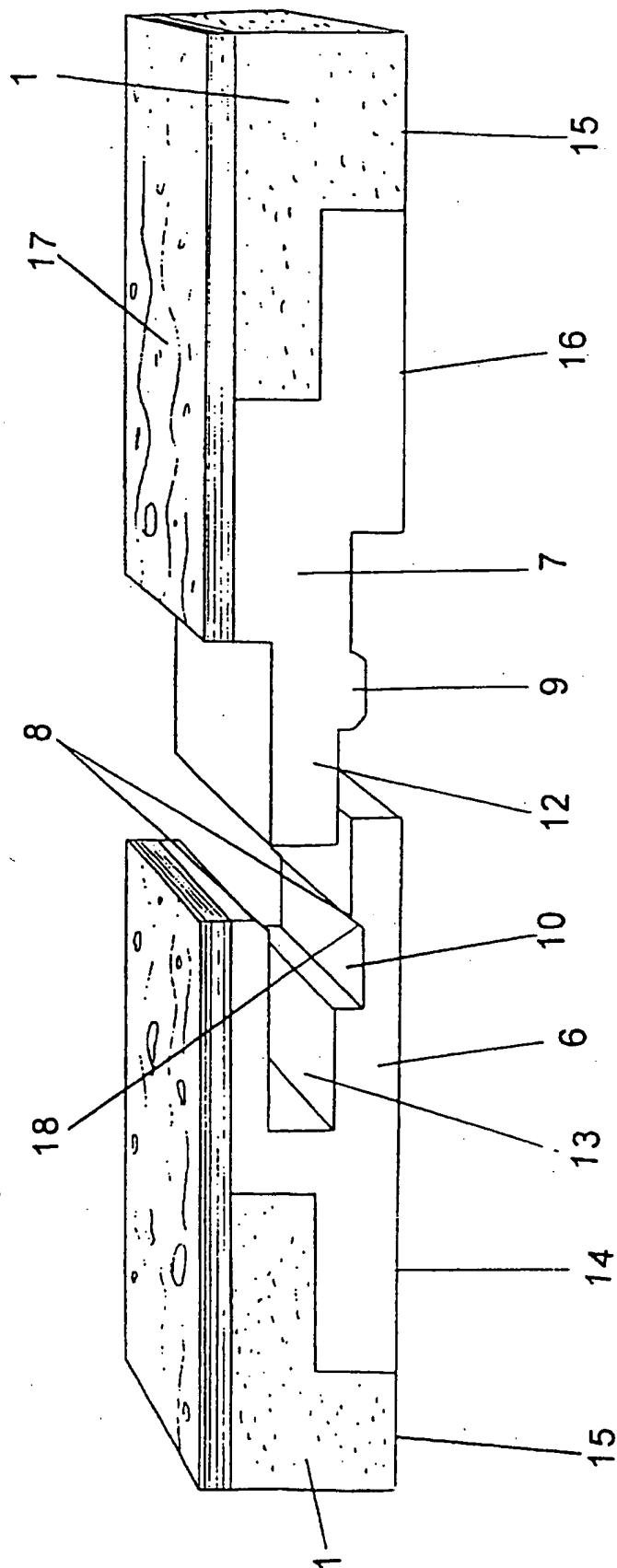


Fig. 3



1
INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 96/00256

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E04F 15/04, E04F 15/14, E04F 13/08
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5295341 A (M. KAJIWARA), 22 March 1994 (22.03.94), column 2, line 46 - line 47, figures 2, 4, abstract, details 14,16,30,32 --	1-10,11
Y	GB 1430423 A (GKN SANKEY LIMITED), 31 March 1976 (31.03.76), figures 1,2, details 12,19,20 --	1-10,11
Y	US 5216861 A (S.C. MEYERSON), 8 June 1993 (08.06.93), detail 32 --	11
A	GB 2256023 A (MAGNET HOLDINGS LIMITED), 25 November 1992 (25.11.92), abstract -- -----	1-14

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

- | | |
|---|--|
| <ul style="list-style-type: none"> * Special categories of cited documents: *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed | <ul style="list-style-type: none"> *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art *&* document member of the same patent family |
|---|--|

Date of the actual completion of the international search 26 June 1996	Date of mailing of the international search report 02.07.96
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Örjan Nylund Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/04/96

International application No.
PCT/SE 96/00256

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US-A-	5295341	22/03/94	WO-A- 9401628	20/01/94
GB-A-	1430423	31/03/76	JP-A- 50031248	27/03/75
US-A-	5216861	08/06/93	US-A- 5086599	11/02/92
			AU-B,B- 626781	06/08/92
			AU-A- 7529991	07/11/91
			CA-A- 2041151	25/10/91
			GB-A,B- 2243381	30/10/91
GB-A-	2256023	25/11/92	NONE	